

BOOK REVIEW

The Forgotten Pollinators by Stephen L. Buchmann and Gary Paul Nabhan. 1996 (paper 1997). 292 pp. 33 illus. ISBN 1-55963-353-0 \$27.50 (cloth) \$16.95 (paper). Island Press/Shearwater Books, Washington, DC/Covelo, CA.

In the Berlin/Dahlem Botanical Garden there stands a small stone memorial inscribed with the title page of a book by Christian Conrad Sprengel entitled *Das entdeckte Geheimniss der Natur im Bau und in der Befruchtung der Blumen* (*The secret of Nature revealed in the structure and fertilization of flowers*), published in 1793. It illustrates a wide range of floral mechanisms and the insects that operate them and pays tribute to the founder of detailed and comprehensive descriptive studies in pollination ecology over 200 years ago, continued by Hermann Müller and Paul Knuth in the nineteenth and early twentieth centuries.

In the first five chapters of *The Forgotten Pollinators*, Buchmann and Nabhan review some of these early descriptions and add more recent information on floral function derived experimentally. The next three chapters deal with human disruptions of natural pollination associations including disruptions in fragmented habitats, threats to migratory pollinators, and destruction of natural populations by clearing of forests and application of herbicides and insecticides. Chapters nine and ten draw a stark comparison between sustainable resource gathering from native insect colonies and the disruptive effect of introduced hives of honeybees, pejoratively labelled “almost camp followers of man.” The next chapter favorably views the “economics of pollination” in terms of cultivation of native pollinators with examples from alkali and leafcutter bees. Running through the entire volume is the theme of conservation of native plant–pollinator associations by preserving habitats and biotic communities. It culminates in a final chapter advocating “pollinator gardens” and “ecological restoration” with a “call for a national policy on pollination” as an appendix.

Buchmann and Nabhan raise some fundamental issues in the conflict between commercial and conservation interests regarding reciprocal reproductive associations of native plants and pollinating animals, mostly insects. They recommend cultivation of specific crops within the geographic ranges of their native, i.e.,

“forgotten,” pollinators and cultivation and transport of pollinators within their native ranges. Where pollinators are migratory and habitats are fragmented, vegetation corridors linking discrete plant populations are suggested. The difficulty of maintaining genetic integrity in cultivated crops grown adjacent to native taxa with which they are reproductively compatible is also discussed.

Controversial concepts needing corroborative data are introduced including competition between pollinators for floral resources, “diffuse coevolution,” and pollination syndromes. The authors correctly recognize the unwarranted establishment of pollination syndromes solely on the basis of floral morphology. The inclusion of a table of pollinator syndromes (pp. 66–67) with many floral characteristics demonstrates the limited applicability of such generalizations. The difficulty of demonstrating competition and its persistence in pollination associations is also recognized. The claim that sequential anthesis on the alpine tundra reduces pollinator competition, however, seems unlikely in view of the short growing season of temperate and subarctic alpine tundras.

The narrative style of the book is informal and idiomatic. The authors have succeeded in weaving the warp of scientific expression with the woof of popular understanding without losing technical accuracy. Technical terms are italicized in the text and explained, with some omissions, in a glossary. Appendices include “a call for a national policy on pollination,” a list of pollinators of major crop plants, a list of conservation and research organizations, a list of sources of supplies for pollination techniques, a summary of pollinator classes for the world’s wild flowering plants, and a list of common agricultural pesticides with their toxicity to pollinators. A detailed index is included. The book is a useful addition to conservation literature. Reading *The Forgotten Pollinators* is an unforgettable experience.

—LAZARUS W. MACIOR, Department of Biology, The University of Akron, Akron, OH 44325-3908.